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NATIONAL RECRUITMENT INITIATIVE

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EXECUTIVE SUMMARY

The National Recruitment Initiative was created to develop Agencywide hiring strategies and tools that focus on NASA's current and future science and engineering recruitment needs. The initiative is being conducted in three phases.

Phase 1 began in May 2001 by analyzing current NASA science and engineering (S&E) workforce data, the science and engineering pipeline, and the use of recruitment incentives. Recruitment needs were identified through Center interviews with science and engineering directors, hiring managers, human resource and equal opportunity directors and staff, education officers, recent college graduates, and new hires. Best practices, S&E data, and Center interviews were analyzed, and a model was developed to strengthen NASA's recruitment program. This report provides a detailed analysis of the findings, as well as the strategies and tools identified.

Phase 2 will focus on the development and implementation of the recruitment strategies and tools. These strategies and tools will be reviewed and prioritized, and teams will be established to develop and implement them. In addition, a marketing plan will be developed to heighten awareness of the need for a strong recruitment program and to use the NASA insignia as a tool to build a strong employment brand.

Phase 3 will focus on refining and evaluating the tools of NASA's recruitment efforts.

NASA S&E WORKFORCE

A review of the current NASA S&E workforce reveals that 24 percent of current S&E employees will be eligible to retire within the next five years. NASA's S&E diversity is comparable to that of the U.S. S&E workforce, which remains dominated by white males.

SCIENCE AND ENGINEERING PIPELINE

The science and engineering pipeline is shrinking, while industry demand for these skills is increasing. NASA must maintain a competitive edge in order to obtain a relative share of graduating S&E students. In addition, NASA's efforts to create a diverse workforce will remain a challenge because white males continue to dominate the pipeline.

NASA MANAGEMENT'S RECRUITMENT CONCERNS

NASA S&E directors, hiring managers, and human resource directors frequently cited the impact that an untimely recruitment program, slow hiring process, and noncompetitive Federal salaries have on their ability to attract and hire highly qualified candidates. Increasing numbers of retirements, shrinking student pipelines, and limited diversity within the S&E workforce and student pipeline were also cited as concerns.

DEVELOPING RECRUITMENT STRATEGIES AND TOOLS

A successful recruitment program requires leadership support, full use of the flexibilities allowed by current law and regulation, a commitment by NASA Headquarters to seek further flexibilities as needed, and a solid structure and process.

Historically, NASA has replenished the S&E workforce by hiring recent college graduates and grooming them through on-the-job experience and further education to assume supervisory and managerial positions (a grow-your-own philosophy). With a potential onslaught of retirements and a decreased S&E student pipeline, it is necessary to develop a recruitment strategy to attract and hire both entry-level and more experienced employees to replenish the workforce.

A robust, agile, and flexible recruitment model was developed to equip recruiters and managers with the strategies and tools needed to attract the best and brightest. The model consists of three components:

Focus on the Candidate—The current recruitment program focuses on the process—not the individual. NASA's recruitment program must be targeted, personal, responsive, and timely.

Leverage Partnerships and Alliances—NASA must fully utilize established relationships with private-sector and university partners and foster new and existing alliances to further recruitment.

Tailor Recruitment Opportunities—NASA must recognize the value of targeted recruitment and employer "brand recognition" and take advantage of the NASA insignia to strengthen recruitment efforts.

TAILOR RECRUITMENT OPPORTUNITIES

LEVERAGE PARTNERSHIPS AND ALLIANCES   FOCUS ON THE CANDIDATE

INTRODUCTION

The National Recruitment Initiative was created to develop Agencywide hiring strategies and tools that focus on NASA's current and future science and engineering recruitment needs.

In May 2001, a Headquarters-based team was established to study, facilitate, and complement Center recruitment efforts by

- developing Agencywide recruitment strategies that will improve NASA's reputation as a premier employer;

- linking Agency student education feeder programs to hiring opportunities at the Centers;

- suggesting new recruitment tools and marketing materials that enhance NASA's appeal as an employer of choice (e.g., CDs, videos, Web sites, mass marketing, bilingual brochures, and student giveaways);

- promoting long-term NASA relationships with colleges and universities (e.g., providing Centers with NASA scholarship and grant information to create new opportunities for recruiters);

- recommending ideas for an Agencywide clearinghouse to share best practices; identify new outreach sources; and maintain database of recruitment schedules, EEO, and other recruiting events to promote employment opportunities; and

- planning the framework of Agency-coordinated recruitment trips.

DATA COLLECTION AND INTERVIEWS

The current NASA science and engineering workforce and student pipelines were reviewed in order to assess NASA's recruitment needs. The National Recruitment Team began data collection and information gathering in May 2001. Three main areas were identified for study and included the following sources:

Science and Engineering Profile (NASA and Pipeline)
Personnel/Payroll System Database
National Science Foundation (NSF)
Bureau of Labor Statistics (BLS)
National Association of Colleges and Employers (NACE)

Hiring Programs and Tools
(NASA, Government, Industry)
NASA Center Best Practices
Industry and Government Best Practices

Recruitment Issues, Concerns, Ideas, and Perceptions
NASA Senior Management
Office of Human Resources and Education
Office of Equal Opportunity
Centers

Interviews Conducted at the NASA Centers Listed Below
Langley Research Center, Hampton, VA
Goddard Space Flight Center, Greenbelt, MD
Ames Research Center, Moffett Field, CA
Glenn Research Center, Cleveland, OH
Marshall Space Flight Center, Huntsville, AL
Johnson Space Center, Houston, TX
Kennedy Space Center, Kennedy Space Center, FL

Directors of science and engineering, human resource directors and chiefs of employment/staffing or recruitment, recruiters (both human resource and technical), equal opportunity staff, education staff and university affairs officers, hiring managers, and new and recent hires were asked a series of recruitment questions. The questions and their responses have been consolidated and are included in Appendix A.

NASA'S SCIENCE AND ENGINEERING WORKFORCE

(As of September 22, 2001)

FIFTY-NINE PERCENT OF THE NASA WORKFORCE CONSISTS OF SCIENTISTS AND ENGINEERS.

Total Number of S&E Workforce in
Comparison to the Overall NASA Workforce Overall
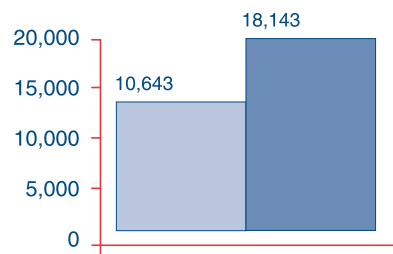
Source: Personnel Payroll System Database, 9/22/01

There are 10,643 scientists and engineers employed by NASA. The NASA S&E workforce is defined as all individuals who are classified in any science or engineering occupation in accordance with the Office of Personnel Management (OPM) classification standard definitions.

NINETY-TWO PERCENT ARE IN POSITIONS AT GS-13 OR ABOVE.

Percent of S&E Workforce By Grade
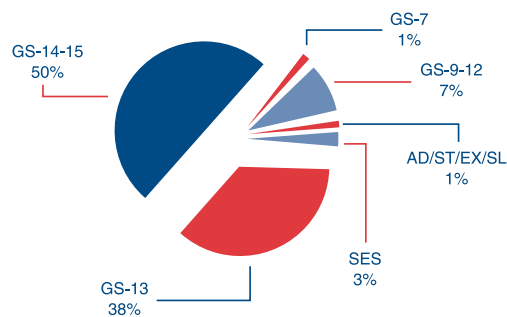
Source: Personnel Payroll System Database, 9/22/01

NASA S&E work is highly technical and specialized, requires a high level of decisionmaking and responsibility, and emphasizes overseeing work accomplished through a contractor workforce as well as through the academic community. Experienced personnel are relied upon to make decisions and be held accountable for them. They direct contractors who perform mission-critical work. It is very important that they speak with authority and experience when they identify inconsistencies or errors that are not in conformance with the contract.
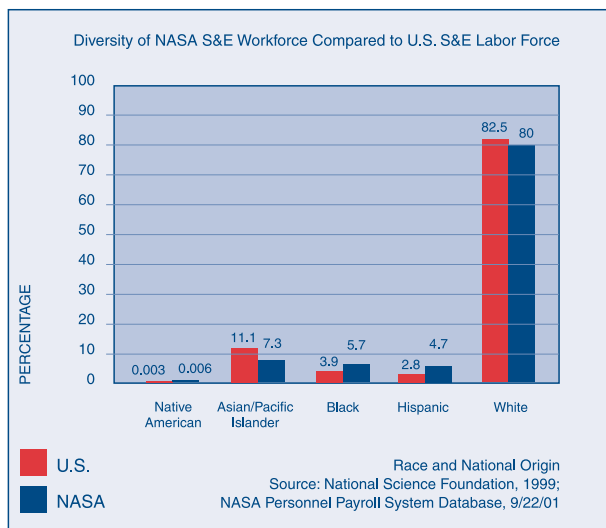
OTHER STATISTICS:

Thirty-five percent are classified as aeronautical engineers.
Ninety-eight percent are full-time, permanent employees.
Fifty-one percent have obtained a master's degree or Ph.D.
Seventy-five percent are above age 35; the average age is 45.
The annual attrition rate is 3 percent for the last nine years.
Average retirement age is 61.

TWENTY-FOUR PERCENT OF THE CURRENT S&E WORKFORCE WILL BE ELIGIBLE TO RETIRE WITHIN THE NEXT FIVE YEARS.

It is estimated that as of September 22, 2001, 1,554 members of the S&E workforce were eligible to retire voluntarily at any time. An additional 1,117 will become eligible to retire over the next five years—by September 22, 2006. This number represents 24 percent, or approximately one quarter, of NASA's core expertise. It is imperative for NASA to begin to prepare for the departure of many of its most senior scientists and engineers by developing a recruitment strategy that focuses on hiring mid-level as well as entry-level talent.

DIVERSITY OF THE NASA S&E WORKFORCE MIRRORS THAT OF THE U.S. S&E LABOR FORCE.

Diversity of NASA S&E Workforce Compared to U.S. S&E Labor Force

U.S.
NASA

Race and National Origin
Source: National Science Foundation, 1999;
NASA Personnel Payroll System Database, 9/22/01

NASA's S&E diversity was compared to the U.S. S&E labor force as reported by the National Science Foundation (NSF) in 1999. As can be seen in the chart above, the diversity of NASA's workforce mirrors that of the U.S. S&E labor force, and it remains dominated by white males. NASA female representation, at 18 percent, is also in proportion to the 19-percent U.S. S&E female representation. Although the S&E workforce within the United States continues to be predominantly white and male, NASA should continue to ensure that candidate pools are as diverse as possible in order to assist hiring managers in making selections that are representative of the Nation's diversity.
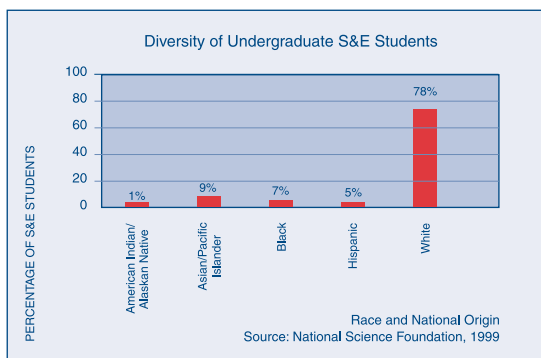
STUDENT SCIENCE AND ENGINEERING PIPELINE PROFILE

By 2008, there will be 7.5 jobs for every 10 people, not workers but people.
Source: Dr. Stephen Fuller, Professor of Economics, George Mason University

During the same time that NASA expects to lose as many as 24 percent of the current S&E workforce, U.S. colleges and universities are experiencing a decrease in the number of undergraduate students in science and engineering.

In 1999, there were 411,308 undergraduate science and engineering students; of that number, 109,904 were foreign nationals, leaving a viable candidate pool of 301,404 American undergraduate students. The chart below depicts the diversity of the undergraduate student population in 1999. The lack of diversity within the student pipeline will make it harder for NASA to obtain greater diversity within the workforce.

Diversity of Undergraduate S&E Students

Race and National Origin	Percentage
American Indian/Alaskan Native	1%
Asian/Pacific Islander	9%
Black	7%
Hispanic	5%
White	78%

Source: National Science Foundation, 1999

GRADUATE ENROLLMENT IS DECREASING.

As undergraduate enrollment declines, so does graduate enrollment. The number of S&E graduates has continued to decline since 1992. NASA relies on a highly educated S&E workforce. With a decreasing number of S&E undergraduates choosing to continue their education, it is important for NASA to continue to provide graduate education opportunities not only for the benefit of NASA, but also as an investment in the future of the United States of America.
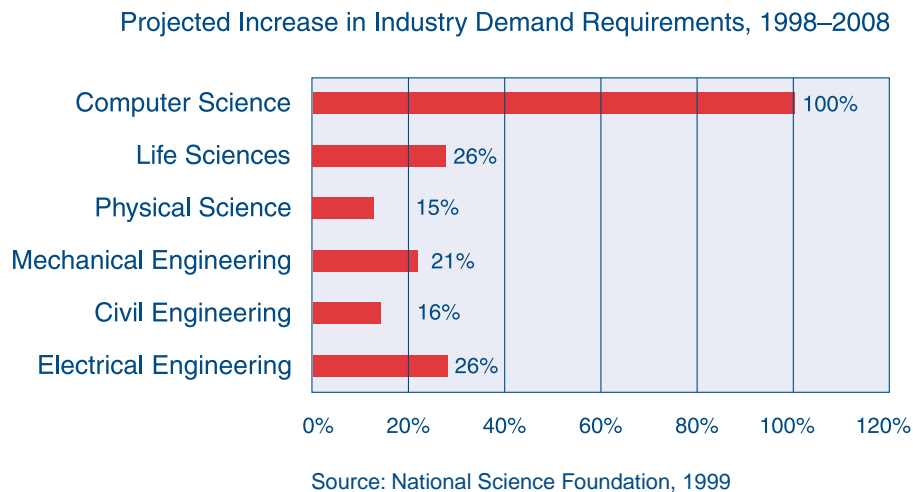
Graduate Engineering Student Enrollment, 1992–1998

Year	Enrollment
1992	128,854
1995	118,506
1998	110,355
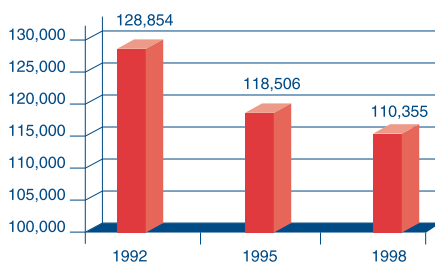
Source: National Science Foundation, 1999

INDUSTRY DEMAND IS GROWING.

At the same time that student admissions are shrinking, technology is replacing the demand for people to perform redundant and routine work. The remaining work for humans is broader in scope, requires greater judgment, is increasingly complex, and requires a high level of technical skill. The NSF projects a substantial increase in demand for S&E workers as displayed in the following chart.

Projected Increase in Industry Demand Requirements, 1998–2008

Discipline	Value
Computer Science	100%
Life Sciences	26%
Physical Science	15%
Mechanical Engineering	21%
Civil Engineering	16%
Electrical Engineering	26%

Source: National Science Foundation, 1999

NASA LINKS TO GRANTS AND SCHOLARSHIPS

Because of the dwindling number of students graduating in the S&E disciplines, NASA needs to take greater advantage of its links to colleges and universities that receive research grants. Specific grant information, including a listing of the top 50 colleges and universities that receive NASA research grants, is in Appendix B.

NASA's Education Division in the Office of Human Resources and Education tracks research grant distribution and the Principal Investigators (PIs) assigned to each grant. The PI, normally a professor, is a great resource to identify the best and brightest S&E students. NASA should take advantage of this potential recruitment resource by contacting PIs before job fairs or on-campus interviews to identify promising candidates.

NASA student internships, scholarships, co-op programs, fellowships, and equal opportunity programs are not centrally tracked. The Office of Equal Opportunity has a number of scholarships, internships, and connections with historically black colleges and universities, Hispanic-serving institutions, tribal colleges, and other minority-serving educational institutions. The Minority University Research and Education Division (MURED), which is part of the Office of Equal Opportunity, spent $82 million in FY 2001 on internships, tuition assistance, research grants, and the building of infrastructures in math, science, and engineering curricula. A comprehensive list, with barcodes or direct hyperlinks, would be a great recruitment resource and would also provide students with an opportunity to investigate all NASA grant and internship opportunities at a consolidated location.

RECRUITMENT DIMENSIONS

"When asked about fixing the government's hiring problems, survey respondents favored expanded recruitment efforts on college campuses, a faster and simpler job application process, more competitive salaries and a student loan forgiveness program."
—Hart/Teeter Survey, October 23, 2001

A recent report published by the National Academy for Public Administration entitled, *The Quest for Talent: Recruitment Strategies for Federal Agencies*, explains that recruitment is a larger part of an organizational system. Recruitment success is influenced by factors such as the organization's mission, values, goals, priorities, strategies, resources, and most importantly, its culture. The report cites three dimensions of recruiting: Leadership, Law and Regulation, and Structure and Process.

- Leadership defines and influences the environment within which recruiting is performed. Supportive and active leadership is fundamental to successful recruiting. NASA leaders must be made aware of the S&E hiring issues that face the organization and support the recruitment program.

- Law and Regulation contributes to the ability of NASA to successfully attract needed talent.

- Structure and Process is the organizational alignment, policies, resources, and processes that support workforce planning and recruitment.

Each of these components defines and influences what recruiting is and how it is accomplished.

LEADERSHIP SUPPORT IS CRITICAL.

NASA leadership plays a critical role in recruitment. In this context, the term "leadership" is defined to include all leaders, from the most senior corporate executive down to the first-level supervisor. They support organizational recruitment efforts in two ways:

Marketing—Selling NASA's mission and its position as an employer of choice to key constituents, organizations, and academia is vital.
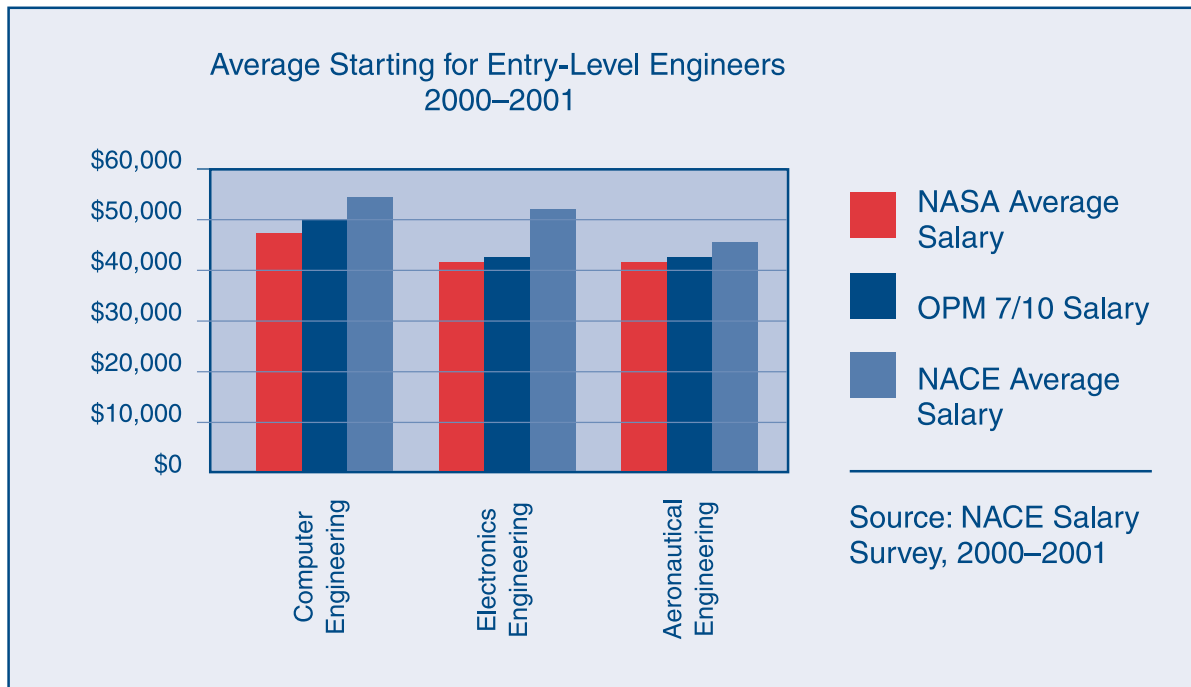
Decisionmaking—Decisions made with regard to workforce planning and management of required Full Time Equivalent (FTE) spaces are critical. Recruitment efforts must be aligned with workforce requirements, and FTEs must be available when needed in order to make timely offers of employment.

NASA USES FLEXIBILITIES PROVIDED BY LAW AND REGULATION.

During Center interviews, the most frequently mentioned hiring challenge was "noncompetitive Federal salaries." NASA recruiters consistently stated that top candidates were receiving offers ranging from $10,000 to $20,000 more than the standard, Federal, entry-level position.

NASA USES ADVANCED IN-HIRE RATES TO OFFER COMPETITIVE STARTING SALARIES.

The following chart compares the difference between engineering starting salaries in 2001. The average offer for entry-level computer engineers, as reported by the National Association for Colleges and Employers, was $53,653. The highest annual salary—which is Grade 7, Step 10—as provided by the OPM General Schedule Special Pay Rates for Engineers, is $49,475. The average salary for computer engineers at NASA is $47,277.

Average Starting for Entry-Level Engineers 2000–2001

Legend:
- NASA Average Salary
- OPM 7/10 Salary
- NACE Average Salary

Source: NACE Salary Survey, 2000–2001

To combat the widening salary gap, NASA Centers also use accelerated training agreements that enable eligible engineers at Grade 7 and 9 an opportunity to be promoted after six months at each grade level.
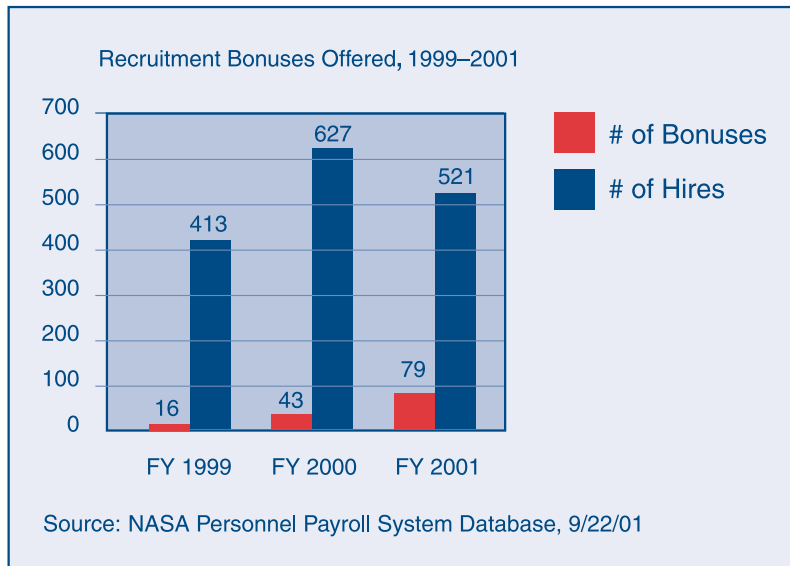
THE THREE R'S: RECRUITMENT, RETENTION, AND RELOCATION INCENTIVES

NASA Centers are increasing the use of hiring incentives to attract candidates and retain employees. These flexibilities, commonly referred to as the three R's—recruitment, retention, and relocation incentives—were offered by OPM beginning in 1991. It is important to note that the payment of these bonuses comes from the Center budget—there is no extra money for the payment of these bonuses. Most Center managers said that budget constraints kept them from making greater use of all of these flexibilities.
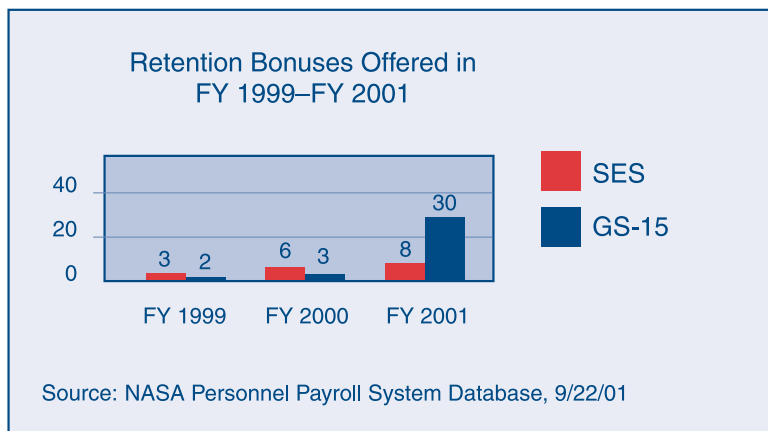
RECRUITMENT BONUSES ARE USED TO FILL THE SALARY GAP.

The number of recruitment bonuses offered to S&E candidates in the past three years has increased significantly. The following chart shows the number of recruitment bonuses in relationship to total hires. Recruitment bonuses are used most frequently to entice entry-level (primarily Grade 7) and experienced workers (Grade 13–Grade 15) to accept employment offers.

Recruitment Bonuses Offered, 1999–2001

FY	# of Bonuses	# of Hires
FY 1999	16	413
FY 2000	43	627
FY 2001	79	521

Source: NASA Personnel Payroll System Database, 9/22/01

RETENTION BONUSES HAVE INCREASED.

In FY 1997 and 1998, only four retention bonuses were offered to keep NASA employees from leaving for jobs in the private sector. However, retention bonuses increasingly have been offered to Grade 15 and Senior Executive Service (SES) members during the past three years.

Retention Bonuses Offered in FY 1999–FY 2001

FY	SES	GS-15
FY 1999	3	2
FY 2000	6	3
FY 2001	8	30

Source: NASA Personnel Payroll System Database, 9/22/01

The increase may reflect the disparate salaries of executive and managerial positions in the public sector. Retention bonuses should continue to be monitored to determine if this trend continues.

RELOCATION BONUSES ARE USED TO PROMOTE MOBILITY.

NASA S&E Relocation Bonuses Given From FY 1994–2001
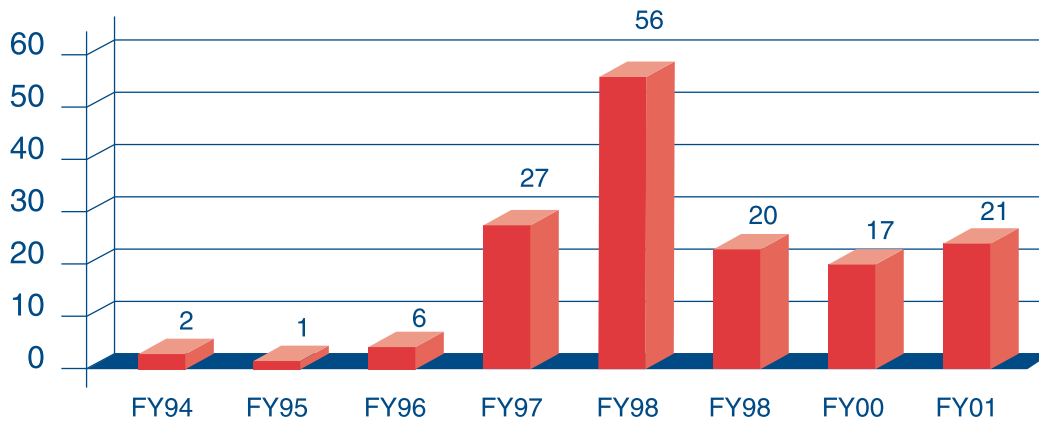
Source: NASA Personnel Payroll System Database, 9/22/01

The large number of relocation bonuses offered in FY 1998 is attributed to the downsizing of the Space Shuttle Program Office at Johnson Space Center. NASA employees who relocated from Houston, TX, to another NASA Center were offered relocation bonuses to offset moving expenses.

Increasing Federal S&E salaries to compete with private industry is important. NASA's Office of Human Resource and Education policy staff will continue to work with Congress to address salary, as well as issues such as scholarships for service. However, the focus of this report is on identifying opportunities to increase NASA's competitive edge by developing recruitment materials that focus on NASA's strengths: challenging work, a supportive work environment, flexible and alternative work schedules, telecommuting, and generous leave benefits. These benefits can be just as important to potential candidates as monetary gains and should be used to market NASA employment.

STRUCTURE AND PROCESS CAN BE CHANGED OR MODIFIED TO SUPPORT NASA'S RECRUITMENT PROGRAM.

How an agency structures its recruiting program and associated internal processes is a critical element in recruitment and must reflect the organization's culture, mission, goals, and objectives. Recruitment is not a structured process—there are no correct strategies, processes, or procedures—each organization has to rely on its own particular culture to identify what recruitment strategies will work.

NASA RECRUITMENT MODEL

The National Recruitment Team developed a NASA recruitment model to address structure and process issues. The model is agile, flexible, and candidate-centered; maximizes current networks and forges new relationships to identify highly skilled candidates; and markets NASA's attributes as an employer of choice. Each component of the model addresses specific concepts and provides descriptions of the tools to be developed. This report does not encompass every recruitment strategy or tool available. However, the information presented should be used as a guideline when putting together a Center-specific recruitment strategy.

Focus on the Candidate • Tailor Recruitment Opportunities • Leverage Partnerships and Alliances

TAILOR RECRUITMENT OPPORTUNITIES

LEVERAGE PARTNERSHIPS AND ALLIANCES   FOCUS ON THE CANDIDATE

FOCUS ON THE CANDIDATE.

A recent Hart and Teeter survey showed that although people are feeling more patriotic and better about the Government, only 16 percent of college graduates and 17 percent of professionals and managers stated that they would be interested in working for the Government. College graduates believe that private-sector jobs offer more interesting and challenging work than the Government and are more likely to reward outstanding performance.
Source: Hart/Teeter Survey, October 2001

This study found that NASA recruitment is centered on the process—not on the candidate. The application process takes too long, offers are not timely, and the timing of on-campus recruitment is out of sync because of budget shortfalls, FTE constraints, and hiring freezes.

CONNECT WITH CANDIDATES.

Research shows that companies who are able to establish a connection with candidates are more likely to succeed in hiring them. NASA needs to personalize the recruitment process in order to entice candidates to join the NASA team. As NASA continues to compete with other industry leaders to attract talent, it is critical for NASA to sell the work to individuals who never may have thought of pursuing Government work. Recruitment and marketing tools will need to be developed to overcome the stigma that is sometimes associated with Government work.

PROPOSED TOOLS:

CD-ROM business cards can provide information about working for NASA. The format will include links to *NASA Jobs* and *NASA STARS* as well as provide information on NASA as an employer of choice.

Cameo video clips can be linked to the vacancy announcement to provide candidates with a real look at the work. These 1-to-2-minute video clips, presented by the supervisor, current employee, or someone who knows the work, would explain the job duties, challenges, and the work environment.

A student Web site can provide one-stop shopping to students interested in NASA employment opportunities. The Web site will provide information on internships and summer employment opportunities, as well as information on jobs and application procedures. It will also link students to the *Education Program* Web site so that they can find out about NASA's scholarship and grant programs.

The NASA Friends Program will provide an opportunity for high-potential candidates to obtain "the lowdown" on being a NASA employee from someone with whom they can establish a bond. NASA Friends will be modeled after the Cisco and Microsoft "buddies" program. NASA Friends will be linked by occupation, college/university affiliation, and by NASA Center location.

NASA videos can be designed for college presentations, as well as for industry and trade association conferences and job fairs.

Incorporate "push technology" into *NASA Jobs* to allow individuals who are interested in NASA employment opportunities to subscribe and automatically receive new job announcements via e-mail.

TAKE THE FOCUS OFF OF THE PROCESS.

Through increasing use of automated systems and the Internet, candidates have come to expect up-to-date information and ongoing feedback throughout the hiring process. Companies must keep individuals informed on the status of their application and be able to make timely job offers if they want to be competitive.

NASA STARS was deployed to all Centers during the fall of 2001. The system is based upon the private-industry tool, Resumix. It will expedite the application process, as well as the issuance of referral lists, and improve overall applicant response time. In addition, *NASA STARS* will soon be upgraded to include the capability to send vacancy announcements directly to individuals who identify themselves as interested in NASA employment.

MAKE TIMELY OFFERS OF EMPLOYMENT.

Nearly all S&E directors, hiring managers, and technical recruiters cited not being able to make timely offers of employment to recent college graduates and experienced professionals as one of the major reasons that they can't hire the best candidates. All efforts should be made to ensure that offers of employment are made in a timely manner. With a shrinking S&E pipeline and more employees retiring in the near future, NASA cannot afford to lose out on good candidates due to a lack of timeliness.

PROPOSED TOOLS:

On-the-spot offers can be made by using *NASA STARS* at college interviews and job fairs. By using this automated system, tentative job offers can be extended, pending security clearance and salary justifications.

On-site interviews can help to sell NASA work to prospective candidates. The National Academy of Public Administration's recent publication entitled, *The Quest for Talent: Recruitment Strategies for Federal Agencies*, indicates that many candidates want to visit the prospective employer before accepting an offer of employment. On-site interviews are a great way to give prospective candidates a view of the work environment and the type of work that they would perform, if hired. Many technical recruiters and hiring managers indicated that on-site visits were their best recruiting tactic. A job offer should be extended shortly after a successful on-site visit.

CREATE A ONE-NASA APPROACH TO COLLEGE RECRUITMENT.

Technical and human resource recruiters, as well as recent college graduates, talked about seeing multiple NASA Centers at the same event and the confusion it sometimes caused, as students tried to identify NASA job opportunities. It is important for NASA to present a consolidated image to students as well as to other potential candidates. Coordinating the efforts of all those who are involved in the recruitment effort—technical recruiters, human resource personnel, equal opportunity personnel, and education staff—will help the recruitment effort.

PROPOSED TOOLS:

A logistics coordinator can coordinate campus visits or job fairs when more than one Center is planning to attend. This will result in greater cost efficiencies since the cost of registration fees, booths, and interview rooms can be shared.

Recruitment uniforms should be geared toward targeted candidates. For instance, at college job fairs, recruiters might wear khaki pants and a polo shirt with a NASA insignia on it. At job fairs targeted toward experienced workers, NASA recruiters might opt to wear appropriate business attire.

Job fair and on-campus recruitment materials should be eye-catching and provide information on NASA's mission. Currently, recruitment handouts vary by Center. Some Centers relied solely on brochures to sell their Center. Other Centers distributed creative handouts, such as aliens-on-a-stick, cup holders, pencils, key chains, and other small trinkets emblazoned with the NASA insignia and the *NASA Jobs* Web site address. Technical recruiters who did not have some of the creative handouts felt that they were at a disadvantage.

LEVERAGE PARTNERSHIPS AND ALLIANCES

NASA gets its work done through a wide network of contractors and research institutions. NASA has been able to establish links with many prominent colleges and universities through scholarship and grant programs. These partnerships and alliances should be used as a recruitment resource for finding candidates and for marketing NASA as an employer of choice. NASA will build recruitment tools to strengthen current relationships and develop links to ones that may not be formally established.

LEVERAGE NASA LINKS TO COLLEGES AND UNIVERSITIES.

The National Academy of Public Administration report states, "truly successful employers develop year-round relationships with colleges. This means investing time with career service officials 'gatekeepers' who may have access or influence." The payoff for establishing these relationships is the opportunity to market, establish name recognition on campus, and to begin to be seen by students as a desirable employer. NASA extends money to colleges and universities in the form of research grants and scholarships. In addition, many college and university students participate in internship programs and cooperative education programs. Upon graduation, these students make great recruitment candidates.

USE PRINCIPAL INVESTIGATORS AS A RECRUITMENT RESOURCE.

When NASA recruiters go to job fairs, conduct on-campus interviews, or visit campus placement offices, they are probably not fully aware of the amounts of money that NASA gives to colleges and universities in the form of research grants. A Principal Investigator (PI), usually a professor, is identified for each research grant. These individuals are responsible for carrying out the research, and they supervise students who help conduct the research. PIs are a great resource for identifying the best science and engineering students who are about to enter the job market.

PROPOSED TOOL:

Research grant networking can identify lucrative candidate sources—especially for entry-level positions. This tool will allow hiring officials, human resource recruiters, and other appropriate staff to search for skills by discipline (e.g., nanotechnology or microgravity); by principal investigator (PI); and/or by the NASA researcher who is working on the program or project. This information can be used to contact, discuss, and leverage the names of top candidates for NASA positions.

SHARE ESTABLISHED RELATIONSHIPS TO INCREASE DIVERSITY.

The Minority University Research and Education Division (MURED) spent $82 million in FY 2001 on internships, tuition assistance, research grants, and building the infrastructures in math, science, and engineering curricula. NASA recruiters who are looking for minority candidates should consider forming links to MURED programs. In addition, all equal opportunity directors and staff members have developed relationships with local minority professional associations and with colleges and universities.

PROPOSED TOOL:

A diversity network database can share information on universities and business, Government, and industry associations with minority or disabled populations. This tool will provide points of contact and other important information to assist recruiters in finding minority, female, and disabled candidates.

ALL NASA EMPLOYEES ARE POTENTIAL RECRUITERS.

NASA employees are an effective recruiting resource. NASA employees present scientific or technical papers at professional associations; astronauts periodically make public appearances at events; and executives return to their college or university alma mater—all of these events are recruitment opportunities. NASA should take advantage of these opportunities by providing easily accessible recruitment information, such as handouts and job information, for individuals to take with them to these events.

PROPOSED TOOL:

The Ambassadors for NASA Program will provide recruitment information to NASA employees via the Web site. Whenever NASA employees attend a conference or meeting, they will have an opportunity to take recruitment materials with them. NASA Centers may want to recognize employees who are instrumental in finding individuals who are hired into hard-to-fill positions by providing time off or on-the-spot awards.

ESTABLISH NETWORKS WITH INDUSTRY AND TRADE ASSOCIATIONS.

Explore opportunities to find experienced candidates through industry and trade associations. Some of the best "not-in-play" talent is affiliated with professional, industry, and trade associations. NASA should take advantage of these resources in order to find individuals—especially in critical skill areas—who never may have thought of pursuing a career with NASA.

PROPOSED TOOL:

Direct links to *NASA Jobs* from selected professional association Web sites would enable individuals to explore NASA opportunities within their professional areas of expertise. This would also include links to minority-sponsored professional associations.

FORM PARTNERSHIPS WITH LOCAL CONSTITUENTS.

Establishing relationships within the local community can be very helpful in accomplishing recruitment goals. For instance, if student housing is an issue, perhaps the local chamber of commerce could help to locate some affordable options. Most NASA human resource Web sites provide the names of the prime contractors who support them. If a Center is advertising a hard-to-fill job and a local contract firm is downsizing, then a manager, technical recruiter, or human resource staff member might consider contacting the company and posting an announcement on the firm's Web site or on its employment information board.

TAILOR RECRUITMENT OPPORTUNITIES

Recruitment strategies and their associated tools are not one-size-fits-all solutions. Research and Center visits have shown that workforce motivations are different. For instance, what appeals to engineers is different from what appeals to scientists. This study also found that the requirements of the NASA science community differ from those of the engineering community. Thus, recruitment tools, and the associated marketing, must be tailored to fit the audience.

RECENT GRADUATES WANT GROWTH OPPORTUNITIES.

Generally, emerging workers—recent college graduates or those who are just entering the workforce—have different work expectations from experienced workers. Emerging workers are looking for jobs with challenging work and growth potential. The National Association of Colleges and Employers (NACE) examined what employees value in an employer. The results of their investigation are reflected in the following chart.

"What Employees Value in an Employer"

Category	Value
Room for Advancement	52%
Good Benefits	46%
Continuing Education/Training	41%
Geographic Location	39%
Job Security/Stability	34%
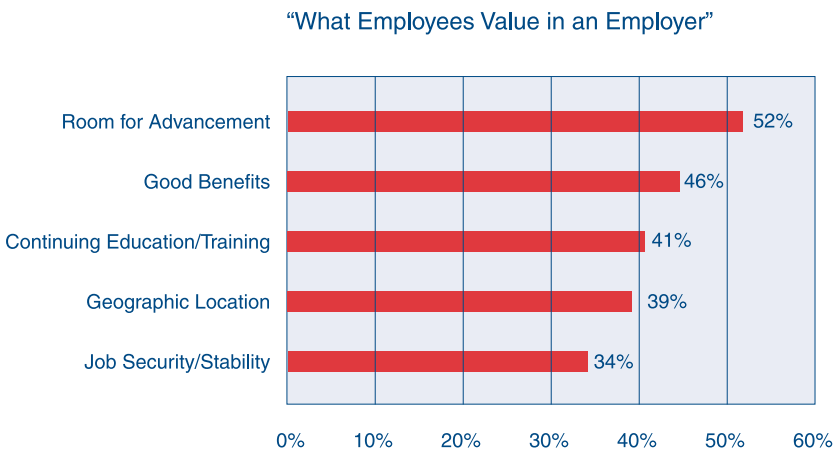
Source: National Association of Colleges & Employers, 2000

Center interviews confirmed the NACE findings, as many recent graduates said that they had turned down higher-paying job offers in order to accept NASA employment because they felt that NASA offered more opportunities for challenging work and career progression.

The Main Reason You Accepted the Job Offer To Work for NASA

Category	Experienced Candidates	Recent Graduates/Emerging Candidates
Stability	10	1
Location		2
Friends		2
Work	4	12

Source: National Recruitment Initiative Site Interviews, July–August 2001

EXPERIENCED WORKERS TEND TO VALUE JOB SECURITY.

Although salary is still a great motivator, experienced workers who accept Federal employment are doing so to gain greater work stability and to decrease their chances of having to be reassigned to another geographic location. Focus group respondents indicated that the stability NASA offered was their greatest motivator for accepting the job. Many of these individuals, who had worked for a Government contractor, had families and ties to the geographic area and did not want to move for a new work assignment.

The current focus on term (not to exceed four years) and temporary appointments poses real challenges for Centers that develop recruitment strategies which focus on hiring experienced talent. Other motivators, such as recruitment bonuses, may have to be offered in order to entice highly qualified, experienced candidates to accept term or temporary appointments.

SCIENTISTS AND ENGINEERS ARE MOTIVATED DIFFERENTLY.

Science and engineering directors and hiring managers all indicated that the motivators for scientists and engineers are very different and that these differences must be recognized in order to attract and retain them.

Engineers are interested in building or constructing new, innovative, or one-of-a-kind products. NASA engineers want to see their "hardware" fly, or their component perform. They are motivated by the opportunity to "get their hands dirty." They are not motivated when their project or program is unexpectedly cancelled or delayed.

Scientists are motivated by the opportunity to work with top researchers in their field. They value their reputation—which is built largely on publications and patents. Scientists who are unable to conduct research, collaborate with their colleagues at conferences and symposia, and publish their studies are not able to build or maintain their scientific reputations. Therefore, employers who have state-of-the-art facilities, provide money for conferences and associated travel, and hire leading scientists are more likely to attract the best and brightest scientists.

CAPITALIZE ON NASA'S BRAND RECOGNITION.

Regarding recruitment, all Center personnel said, "the NASA meatball sells." NASA needs to leverage its insignia and establish an employment brand. An employment brand produces a message about the organization that is quickly assimilated and accepted by candidates. It accurately characterizes the organization's unique employment opportunities and entices individuals to work there.

Consistently, NASA and Governmentwide workforce studies show that NASA has a very satisfied workforce. Recently, NASA was selected by *Washingtonian* magazine as one of the "50 Great Places to Work," one of only seven Government agencies so recognized. While collecting data from the Centers, we consistently heard that NASA work is what sells. The work is why people come to NASA in the first place and why people stay well beyond retirement age.

PROPOSED TOOL:

Developing an employment brand that would become the focal point of all recruitment materials and information that is generated for recruitment purposes. The Office of Human Resources and Education will work with the Office of Public Affairs and with other related offices to develop and implement an employment brand that is indicative of NASA's reputation as an employer of choice.

STRATEGIC WORKFORCE PLANNING

Workforce planning is the "people" part of a strategic plan. The purpose is to define the kind and size of workforce needed to deliver the overall strategic business plan. It identifies the skills required, the number of employees needed, their location, the training requirements, and the recruitment or development efforts needed to fill the gaps. A strategic workforce plan serves as the blueprint for planning a recruitment strategy. During the Center visits, some hiring managers and S&E directors were seeking assistance in identifying their future workforce needs. In one instance, an organization used workforce planning to show current employees—who were beginning to leave for another program—that their work was important and would contribute to the efforts of the new program. Human resource directors indicated that workforce planning was one area where Headquarters, Office of Human Resources and Education, could assist from a policy perspective.

This study recommends that workforce planning be streamlined across the agency and that one model be used for all Centers. Streamlining and the use of one model would help with corporate workforce planning as well as Center efforts.

PROPOSED TOOL:

A statistical workforce profile is a proposed automated tool that will provide managers with information on their workforce demographics in order to help them make decisions regarding their recruitment needs. Information might include current employee retirement eligibility, employment status, grade, and position skills; as well as organizational information, such as attrition rate, number of cooperative education hires, current skill mix, and diversity data.

ESTABLISH A RECRUITER'S NETWORK.

The new recruitment model and strategies will need to be incorporated into the recruitment program and be readily available to all NASA recruiters and managers. There will need to be automation created to support recruiters and to provide them with one-stop information on recruitment strategies, sources, best practices, and tools.

PROPOSED TOOLS:

A recruiter's Web site will be developed to integrate all the recruitment tools on one Web site. Information would include the following:

- **"How-To" Guides.** Using the Web site, *Ask Jeeves*, as a model, NASA can create a tool which allows hiring managers and NASA staff to ask recruitment and retention questions. "How-to" topics would include using retirees as a recruitment resource, establishing alliances with college placement offices, networking with private-sector human resource offices for potential sources and spouse employment, and explaining how to retain top employees.

- **Best Practices Databank.** This area on the recruitment Web site can allow Centers to share their best practices and lessons learned, as well as to share the best practices of private companies. Best practice categories could include candidate sourcing, marketing, trend analysis, assessment procedures, interview techniques, and on-campus recruitment.

- **Recruiter Development Symposium.** This tool can educate and inform all individuals involved in the recruitment process on the latest NASA recruitment strategies, tools, and events. An annual conference, plus periodic e-mails, will provide an opportunity to network, exchange and receive recruitment information, and chart a course for upcoming campus visits and other recruiting events.

DEVELOP RECRUITMENT METRICS.

Performance metrics are important in determining the success of recruitment initiatives. During on-site interviews, most human resource directors indicated that they have performance metrics in place. However, what seemed to be missing was information on why employees were leaving and why candidates declined job offers. This very important information helps identify ways to improve the recruitment process as well as to develop employee retention programs.

PROPOSED TOOL:

A NASA-wide exit interview process can be designed with contractor support to capture feedback on the hiring and interview experiences of candidates who accept or decline job offers. The system will also collect data on why departing employees started to look for other employment opportunities. Collected information will be used to continually improve the hiring process. Best practices have shown that the best way to get this feedback is to survey employees during three different periods: 1) immediately upon acceptance; 2) three months into the position; and, 3) on the first-year anniversary. Candidates who do not accept job offers should be interviewed immediately upon declination of the offer. Departing employees should be canvassed at the time the Request for Personnel Action (SF-52) resignation is received by the personnel office. This data would be captured by the contractor and reported to Headquarters and the affected Center on a monthly basis.

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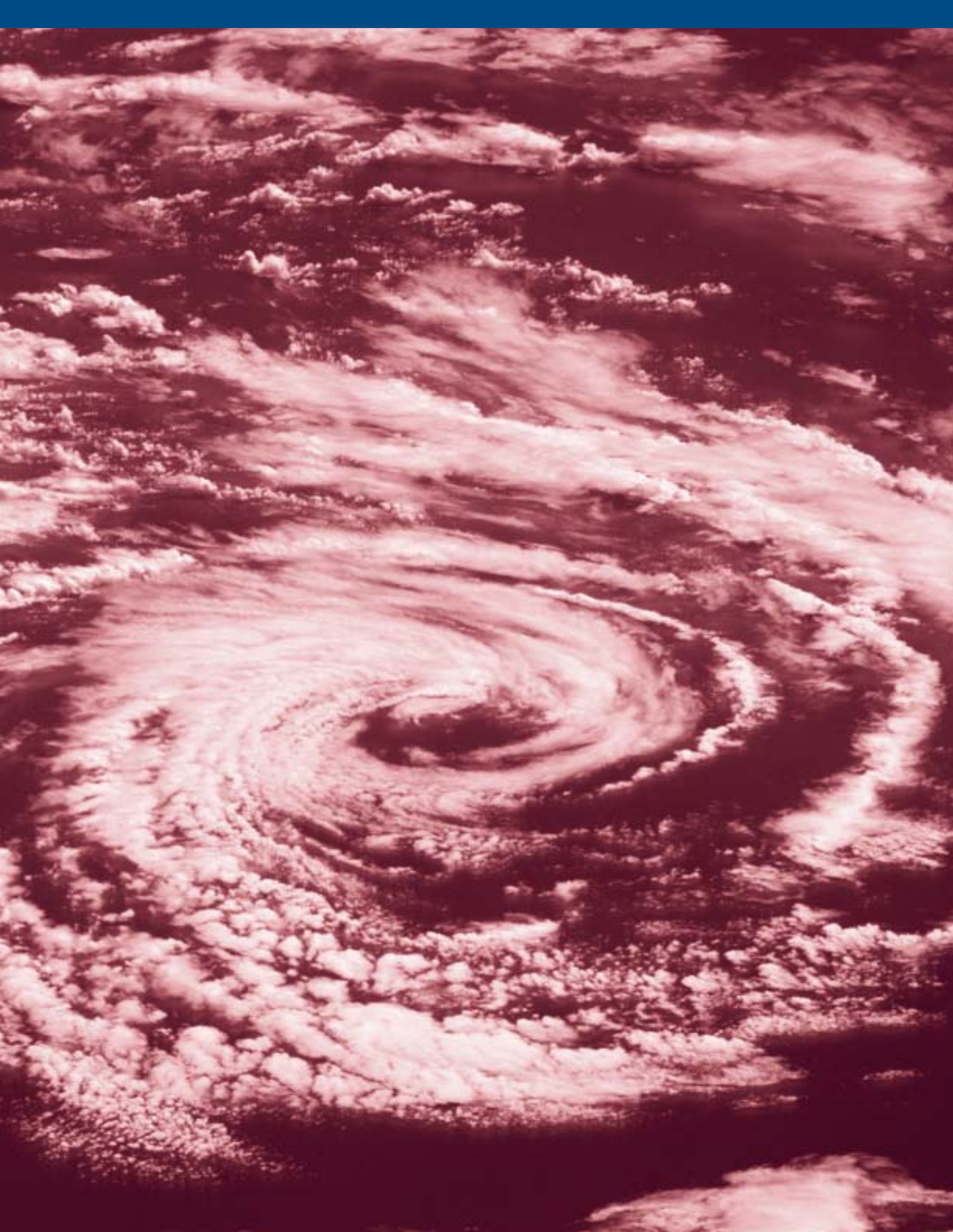
APPENDIX A

By Interview Group

SCIENCE AND ENGINEERING DIRECTORS

1. What are the biggest challenges you are facing in your organization?

Noncompetitive Salaries and Hiring Incentives. All Directors indicated that noncompetitive salaries were their biggest hiring challenge. Specific comments include the following:

- IT salaries are not competitive with private industry.

- Fresh-outs can make $50K to $60K more on outside.

- The OPM IT salary structure needs to include GS-13 through GS-15 employees.

- Relocation package for first duty station is not competitive and has led to declinations.

- Universities compensate their top scientists at $125K to $150K.

Funding and FTE Constraints. Selecting the best candidates is nearly impossible because of continued hiring freezes. Candidates lose interest when they have to wait six months or more for a job offer. Developing a staffing plan is hard to do when funding levels are constantly changing.

Changes in Mission. Reorganizations, restructuring, work realignments, and transitioning of work from civil service to contractor staff result in the following:

- Shifting skills and changing levels of expertise in various S&E disciplines;

- Too much work and not enough people to do it; and

- Workforce stress and lower morale.

Replacing Experienced Talent. There is a need to hire experienced individuals to replace lost managerial skills. This problem will only get worse as more people begin to retire.

Stop-and-Start Hiring. Directors indicated that the recent hiring freezes have hindered their ability to hire the best college graduates. Top graduates receive offers of employment from September through November and from January through March—depending on when they are ready to graduate. If the focus is on hiring new graduates, then NASA has to be able to offer jobs when they are looking for employment.

2. How do these challenges impact your current workforce?

Morale. Comments on morale include the following:

- In order to remain competitive with private industry most new hires are offered advanced in-hire rates and/or recruitment bonuses. There is concern about the impact that these incentives will have on their current workforce—many of whom have not been promoted because of high-grade constraints and infrequent promotion boards.

- There are not enough people to do the work or they are "one deep" in critical skills causing some individuals to work 60 hours a week or more.

- Constant "shut down" rumors keeps workforce on edge. The "fun" work is shifting to contractor personnel and the federal civil servant is left to monitoring contracts.

3. Think out five years, what one or two significant workforce management issues do you expect to encounter?

Changing Skill Requirements. The workforce will need to be flexible and agile workforce. Looking for multi-disciplinary candidates who can multitask and crosscut technologies.

Inability to Hire Qualified Scientists and Engineers. If federal salaries remain noncompetitive, it will be very hard to attract highly qualified candidates.

Inadequate Facilities. Many Center facilities are aging and are no longer considered state-of-the-art. Inadequate and aging facilities make it harder to attract candidates, especially those who are recent college graduates or from private industry.

Retirements. Almost all directors expect to lose critical skills due to retirement—especially senior corporate knowledge.

Privatization. Continued privatization of work will continue to be a challenge.

HIRING MANAGERS

1. What are the biggest challenges you are facing in your organization?

Noncompetitive Salaries. Almost all hiring managers offer advanced-in-hire rates and recruitment bonuses in order to remain competitive.

Stop-and-Start Hiring. Freezes and inadequate hiring windows result in mediocre hires.

Workforce Morale. Hiring freezes and years of downsizing have resulted in fewer employees doing more work. Results in stress and inadequate mentoring of new employees.

Internal Workforce Tension. It is easier to hire someone at GS-14/15 than to promote a current GS-13/14 employee. This creates tension in the current workforce, many of whom have not had the opportunity to be promoted because of high grade constraints, freezes and promotion boards.

Managing FTE Spaces. There is an increasing focus on hiring fresh-outs and other than full-time permanent positions. However, many hiring managers indicate that they need experienced candidates who can start work with little training. These candidates are looking for stability and are usually not interested in accepting a temporary or term position.

Retention Issues.
  Scientists are interested in the following:
• state of the art laboratory facilities; and
• to focus on scientific research; not managing projects or being overwhelmed with paperwork.

  Engineers are interested in the following:
• competitive salaries; and
• balance of hands-on work with need for contract monitoring.

Attracting a Diverse Candidate Pool. There are not enough minorities and women in engineering to fill the vacancies. When they find candidates in these groups, the candidates are often commanding higher starting salaries or are not interested in federal employment.

2. How do these challenges impact your current workforce?

Morale Issues. Increasing pace of work, increase in workload, and stress. Lack of promotions, non-competitive salaries, has resulted in some employees accepting work in private industry (sometimes with the Contractor).

3. Think out five years, what one or two significant workforce challenges do you expect to encounter?

Uncertain Future. Work is uncertain—not sure whether or not it will be supported by Contractors or Federal civil service.

Increased Attrition. Due to increase in retirements which will result in losing managerial skills and corporate knowledge.

Erosion of Skills. Lack of hiring at journey-level will increase erosion of managerial skills. More contractor support will result in NASA employees becoming "paper pushers" which will make it even harder to hire top scientists and engineers.

4. Please tell us about your hires within the last two years.

Some managers had not been able to hire any one during the last two years. Those who had been able to hire indicated that a majority of their journey-level hires were from their contracting workforce. Many of these individuals accepted positions at NASA because of the stability associated with Federal employment. Those managers who had hired recent college graduates indicated that some of their first choices had declined the position because of the salary.

5. Please tell us about your losses within the last five years.

Most losses were due to retirements, reassignments or transfers to other NASA Centers. There were some organizations that had lost people to private industry (mainly to their contractor support).

HUMAN RESOURCE DIRECTORS & CHIEF RECRUITERS

1. Please tell us about the Center's recruitment program/efforts.

Responses appear below.
- All Human Resource Directors consult with the Center Director to identify recruitment issues and develop a recruitment plan.

- Successful recruiting tools include advanced-in-hire rates, recruitment and retention bonuses and quick turn-around time on job offers. The Student Loan Repayment Program will also be a good recruitment incentive but there is concern about the money that it will take to use it.

- All Centers fully utilize the Federal Career Intern Program, Presidential Management Intern Program and the Cooperative Education Program and rely on these programs to fill permanent, full-time positions.

- Focus on providing hiring managers with more diverse candidate pools to increase hiring of minorities, women and people with disabilities. Goals are set at the beginning of the year and efforts are made to identify appropriate sources to increase representation on referral lists.

2. What are the Center's biggest workforce challenges?

Funding and FTE Constraints. Creates missed opportunities to hire top-quality fresh-outs.

Noncompetitive Salaries. Federal salaries for engineers and Information Technology skills are not competitive with the private sector. Almost all Centers offer recruitment bonuses and advanced-in-hire rates to offset the difference.

Increased Workload. Downsizing has increased workload which results in stress, inability to provide as many mentors as needed for fresh-outs and co-ops and lack of knowledge transfer.

Workforce Planning. Helping organizations to determine what skills they need, where the skills can be found.

3. How would managers describe their most significant recruitment issues?

Insufficient FTEs and Hiring Constraints. There is frustration with being required to do more with less and being allowed to hire and then being told that they can't.

Noncompetitive Salaries. When managers are able to hire the salary is a problem especially if they are trying to hire someone in the Information Technology sector.

4. Think out five years, what one or two significant workforce management issues do you expect to encounter?

Aging Workforce. More engineers and scientists will be eligible to retire in the next few years.

Replacing Skills. Noncompetitive salaries and a shrinking S&E pipeline will make it harder to attract and hire individuals to replace employees who retire.

Legal Issues. Dealing with employment issues that involve partnerships with contractors, academia and the private sector.

5. What do you see as the role of FP (and the National Recruitment Initiative) in supporting your recruitment programs?

Responses appear below.
- Develop an agency-level recruitment strategy that focuses on establishing relationships with major colleges that have links to all of the Centers.

- Develop an automated exit interview format.

- Develop NASA's employment branding and marketing strategy.

- Develop NASA-wide recruitment brochures, handouts, videos, CD ROMs.

- Sponsor an annual recruiters symposium to educate and inform participants on recruitment issues.

EQUAL OPPORTUNITY OFFICIALS

1. What university/college relationships/affiliations do you have?

All have established relationships with minority student universities/institutions through MUREP. Each Center has especially strong relationships with MSIs within its region.

Each Center has developed unique programs with local colleges and universities that are designed to make minority and disabled students aware of NASA employment opportunities. Some of these include the following:

- hosting technical assistance workshops to make representatives aware of grant and scholarship funding opportunities;

- participating on curriculum advisory boards; and

- meeting with college/university placement representatives.

2. How are you getting candidates for grant and scholarship programs?

Candidates for grants are selected through the principal investigator who is normally a professor. Scholarship programs are competitive and NASA Headquarters makes the selections.

3. What are the significant challenges you see in diversity and disability hiring?

Placing Students Permanently. There are a lot of students who participate in NASA programs but are not hired.

Noncompetitive Salaries. Federal S&E salaries are not competitive with private industry.

Funding and FTE Constraints. Having the funding to take recruiting teams to targeted minority and dis-ability-populated institutions and conferences.

4. What is your relationship with OHR recruitment and placement programs?

The overall response was that their relationship with OHR was very positive. Specific comments appear below.

- EO and HR work together to establish criteria for hiring and planning which tools to visit.

- HR asks EO to actively participate in recruitment efforts.

- HR shares access to data needed for planning purposes.

- HR consistently asks EO for input on colleges/universities to target for recruitment purposes.

5. What suggestions do you have to link diversity, disability, and grant programs to recruitment opportunities?

Responses appear below.
- Redesign NASA Scholars program so that it better matches the Co-op program. NASA Scholars would benefit from working during other periods of the year (instead of just 10-weeks during the summer).

- Include EO-related fellowships in Agency-wide announcements.

- Continue working closely with HR and managers to link disability programs with other hiring programs.

- Send minority managers on recruiting trips to minority colleges and universities.

- Create metrics in place to hire a specific number of minority interns.

- More local control over the allocation and use of money for local minority and disability outreach programs.

- NASA representation at leading MSIs should be centralized and each Center should be the designated as the lead at certain colleges.

- Improve the NASA jobs Web site so that it is not so cumbersome.

EDUCATION STAFF AND UNIVERSITY AFFAIRS OFFICERS

1. How are you getting candidates for grant and scholarship programs?

Responses included the following:
- rely on researchers to identify them; and
- rely on universities to select them.

2. What are the significant challenges you see in diversity and disability hiring?

Shrinking S&E Pipeline. Most U.S. students are not majoring in science and engineering.

Noncompetitive Salaries. Most minority students are heavily recruited by private sector companies and are offered very high salaries.

Student Awareness: Grant researchers and their students rarely visit NASA Centers. Therefore, students are not made aware of employment opportunities at NASA.

3. What ideas do you have to link the scholarship, fellowship, and grant programs to recruitment opportunities?

Specific comments appear below.
- Establish a database to track students and use that information for recruitment purposes.

- Develop close relationships with five or six minority colleges and universities and use that relationship to identify top S&E talent.

- Create opportunities for grant researchers and students to visit NASA Centers and provide information on employment opportunities.

TECHNICAL AND HUMAN RESOURCE RECRUITERS

1. Please describe the recruitment process and tools that you use.

HR coordinates recruitment trips. Recruiters are told what jobs they will be recruiting and are given a package of materials or a "hands-on" training session to prepare them for the campus visit. Participates in information sessions that are conducted the night before interviews. Sessions are open to all interested students. Includes a video show and question and answer session. The NASA logo and the unique work that NASA does is the best angle to use for selling NASA employment.

Job fair hand-outs varied by Center and included the following:
- focused job descriptions or listings of available positions;

- videos or displays; and

- NASA logo items, including key chains, pens, pencils, cup holders, airplanes, balls, and a space alien on a wire.

2. From everything you know, what are the most significant recruitment issues?

Noncompetitive Salaries.
- The average starting salary posted at Purdue was $10k more than our best offer.

- The Orlando Police Department was offering higher starting salaries.

Slow Hiring Process.
- It takes too long to get paperwork completed.

- It takes too long to make a job offer—by the time the offer is made the candidate has already accepted other employment.

Hiring Freezes and FTE Constraints.
- Hiring freezes and restrictions create "stops and starts" to hiring students. By the time an exception to the freeze is granted the graduating student has accepted another offer of employment.

Recruitment Materials.
- NASA needs eye-catching hand-outs and give-aways

3. How would managers describe their most significant recruitment issues?

Specific comments appear below.
- Difference between available FTEs and the on-campus recruiting season.

- FTEs are not available for campus hiring.

- Mentoring and the time it takes to get recent graduates up to speed.

- Inability to make timely and on-the-spot job offers.

4. Please tell us about your most successful recruitment efforts.

There were not a lot of responses to this question because most technical recruiters did not have the authority to make hiring decisions. Two recruiters indicated that they had been able to hire individuals from job fairs and were satisfied with the quality of the hire.

5. What do you consider your biggest challenges today in accomplishing your recruitment goals?

Specific comments appear below.
- Noncompetitive salaries.

- Housing.

- It's either too expensive or there is not enough leased/rentals available within the area.

- Cumbersome, outdated application and hiring process.

- Students want to apply on-line.

- NASA has to make timely job offers if it wants to get the best & brightest.

Regarding Better Communication and Coordination. Technical recruiters would like to know what happens to the students that they interview. Many of them don't know what happens to interviewees or if they are hired.

6. What new tools, strategies, and support from Code FP would be useful?

Specific comments appear below.
- Develop recruiting materials that are not Center-specific but are adaptable for use by each Center.

- Develop a database that lists faculty members by college/university and academic discipline.

- Coordinate job fairs so that not all Centers are at the same place at the same time competing for the same people.

- Facilitate communications between Centers so that all recruiters know what other Centers are doing and what jobs they need to fill.

7. Do you find the *SMART* site to be useful? What else would you like to see on the site?

Overall, recruiters, especially technical recruiters, were unaware of the site and had no input on what else should be included.

8. Are you getting the quality/quantity of applicants that managers need?

Some technical recruiters said that the number of applications they collected was overwhelming and that there was no easy way to track what happened to the applications after the job fair was over. They also did not know what had happened to the students with whom they talked after the fair was over. Therefore, they did not know if the managers got quality applicants but they knew that there was a great quantity.

Some concern was expressed about the increasing number of students who are receiving a computer technology degree. This type of degree teaches students how to put PCs together and is not a good degree for NASA work since the curriculum does not usually include math or science. One Center also indicated that they did not get as many applicants from the top 10 percent of the graduating class as they had in previous years.

NEW HIRES/RECENT HIRES (within last two years)

1. What were the key factors in your decision to come to work for NASA?

Responses appear below (ranked by frequency).
- Work: Opportunity for challenge and responsibility—cutting-edge technology.

- Childhood Dream: Always wanted to work for NASA.

- Prestige.

- Job Growth/Career Potential.

- Training and Education.

- Stability (of Federal Employment).

- Benefits (flextime and daycare).

- Patriotism-desire to work for the good of the United States.

2. What, in your opinion, are the most critical factors in retaining a top quality S&E workforce at NASA?

The overwhelming response was more competitive salaries. Most recent graduates indicated that they had other comparable job offers with starting salaries that were $20,000 to $30,000 higher than NASA's. However, they accepted the NASA job because they wanted to be part of NASA. Other critical factors are listed below.

- More competitive benefit package. Many found that FEHB was more expensive and the dental and vision benefits were not good.

- More travel money for conferences and symposia—especially for scientists who are asked to present papers.

- Less focus on administrative support functions. There is too much emphasis placed on paper-work and ISO 9000.

3. What ideas do you have for attracting S&E graduates in the future?

Responses appear below.
- Streamline the Hiring Process—job offers need to be more timely.

- Improve the Web site—it's too difficult to find information.

- Improve the Mentoring Program.

- Increase salaries.

- Improve NASA image through marketing and employer branding.

APPENDIX B

NASA GRANT PROGRAMS

Code FE is developing an automated database to consolidate research grant information on a single CD-ROM which tallies, describes, and cross-references all NASA research grants.

The first bar graph shows NASA's obligations to universities from 1971 ($136 million) to FY 2000 ($1.001 billion). These figures exclude awards to the California Institute of Technology for operation of the Jet Propulsion Laboratory.

NASA Obligations to Universities, Including Foreign Universities for Fiscal Years 1971–2000 (Includes De-Obligations)
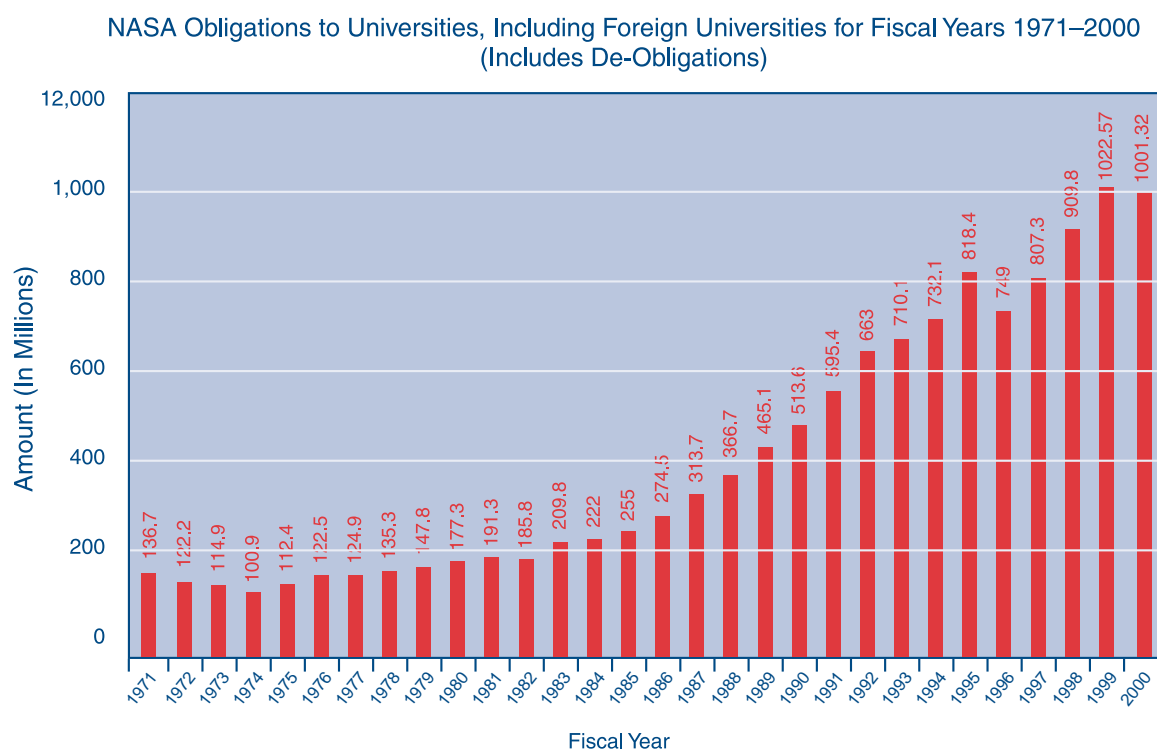
This chart shows the top fifty educational institutions receiving about two-thirds of NASA's total obligations.

LISTED ACCORDING TO TOTAL OBLIGATIONS BY INSTITUTION–FY 2000 (INCLUDES DE-OBLIGATIONS)

	INSTITUTION	OBLIGATIONS	PERCENT
	TOTALS	$1,001,322,453	100.00%
1	JOHNS HOPKINS UNIV.	$95,891,969	9.58%
2	UNIV. COLORADO-BOLDR.	$59,173,201	5.91%
3	STANFORD UNIVERSITY	$48,097,994	4.80%
4	UNIV. MARYLAND-COL. PK.	$36,103,953	3.61%
5	CALIF. INST. OF TECH.	$29,173,945	2.91%
6	UNIV. CALIF.-BERKELEY	$23,709,744	2.37%
7	UNIV. ALA.-HUNTSVILLE	$22,672,993	2.26%
8	MASS. INST. OF TECH.	$21,341,300	2.13%
9	UNIV. CALIF.-SAN DIEGO	$21,336,505	2.13%
10	UNIV. OF ARIZONA	$18,074,882	1.81%
11	BAYLOR COL. OF MED.	$16,820,822	1.68%
12	UNIV. ALASKA-FAIRBANKS	$16,150,535	1.61%
13	UNIV. MO.-COLUMBIA	$16,122,389	1.61%
14	PENN. STATE U.-UNIV. PK.	$15,737,525	1.57%
15	NEW MEX. ST. U.-LAS CR.	$14,764,907	1.47%
16	UNIV. ALA.-BIRMINGHAM	$13,329,377	1.33%
17	UNIV. WISC.-MADISON	$12,193,159	1.22%
18	COLUMBIA UNIVERSITY	$11,553,921	1.15%
19	UNIV. TEXAS-AUSTIN	$10,776,687	1.08%
20	UNIV. CALIF.-L. ANGELES	$10,214,301	1.02%
21	U. OF HAWAII-HONOLULU	$10,195,711	1.02%
22	CAYUGA COMM. COLLEGE	$10,102,500	1.01%
23	WHEELING JESUIT UNIV.	$9,307,353	0.93%
24	UNIV. OF WASHINGTON	$8,768,625	0.88%

25	HARVARD UNIVERSITY	$8,253,889	0.82%
26	UNIV. NEW HAMP.-DURHAM	$8,192,626	0.82%
27	CARNEGIE-MELLON UNIV.	$8,103,195	0.81%
28	UNIV. HOUSTON-CL. LAKE	$7,936,820	0.79%
29	UNIV. MICH.-ANN ARBOR	$7,930,153	0.79%
30	UNIV. CALIF.-S. BARBARA	$7,703,075	0.77%
31	OKLAHOMA STATE UNIV.	$7,647,370	0.76%
32	MISSISSIPPI STATE U.	$7,562,537	0.76%
33	UTAH STATE UNIV.	$7,542,295	0.75%
34	UNIV. CALIF.-IRVINE	$7,493,808	0.75%
35	SAN JOSE STATE UNIV.	$6,956,081	0.69%
36	OREGON STATE UNIV.	$6,777,635	0.68%
37	U. OF MD.-BALT. COUNTY	$6,519,387	0.65%
38	HAMPTON UNIVERSITY	$6,079,214	0.61%
39	CORNELL UNIVERSITY	$6,024,402	0.60%
40	U. OF NEW MEX.-ALBQRQE.	$5,897,746	0.59%
41	TEXAS A&M U.-COL. STA.	$5,808,024	0.58%
42	UNIV. OF MIAMI	$5,193,126	0.52%
43	UNIV. OF VIRGINIA	$5,075,249	0.51%
44	AUBURN UNIV.-AUBURN	$5,053,023	0.50%
45	CASE WESTERN RESERVE	$4,715,267	0.47%
46	UNIV. OF IOWA	$4,666,980	0.47%
47	U. MINNESOTA-TWIN CT.	$4,626,793	0.46%
48	PRINCETON UNIVERSITY	$4,616,633	0.46%
49	UNIV. OF SOUTHERN CAL.	$4,560,005	0.46%
50	GEORGIA INST. OF TECH.	$4,554,827	0.45%
	Other Colleges and Universities**	$284,217,995	28.38%

The third chart shows obligations by field of science or engineering, with the largest sums going to the physical sciences (astronomy, physics, and chemistry) and environmental sciences (atmospheric, geological, and oceanographic).

LISTED ACCORDING TO TOTAL OBLIGATIONS BY FIELD OF SCIENCE/ENGINEERING

	FIELD OF SCIENCE/ENGINEERING	TOTAL	%	OF ALL SCI. & ENGR.
ENGINEERING	ASTRONAUTICAL ENGR.	$57,589,017	33.5%	
	AERONAUTICAL ENGR.	$37,707,162	21.9%	
	CHEMICAL ENGR.	$2,428,953	1.4%	
	ELECTRICAL ENGR.	$7,332,831	4.3%	
	MECHANICAL ENGR.	$12,647,544	7.4%	
	METAL & MATERIALS ENGR.	$12,907,470	7.5%	
	ENGINEERING, NEC*	$41,442,352	24.1%	
Total		**$172,055,329**		**17.2%**
ENVIRONMENTAL SCIENCES	ATMOSPHERIC SCIENCE	$81,035,930	38.5%	
	GEOLOGICAL SCIENCE	$14,981,105	7.1%	
	OCEANOGRAPHY	$10,638,775	5.1%	
	ENVIRONMENTAL SCI., NEC*	$104,003,899	49.4%	
Total		**$210,659,709**		**21.0%**
LIFE SCIENCES	BIOLOGY (EXCLUDING ENVIR.)	$37,109,231	39.9%	
	ENVIRONMENTAL BIOLOGY	$4,930,326	5.3%	
	AGRICULTURE SCIENCE	$1,570,640	1.7%	
	LIFE SCIENCE, NEC*	$43,237,555	46.5%	
	MEDICAL	$6,103,365	6.6%	
Total		**$92,951,117**		**9.3%**
MATH/COMPUTERS	MATHEMATICS	$1,508,815	5.8%	
	COMPUTER SCIENCE	$19,214,713	73.9%	
	MATH/COMPUTER SCI., NEC*	$5,263,952	20.3%	
Total		**$25,987,480**		**2.6%**

	FIELD OF SCIENCE/ENGINEERING	TOTAL	%	OF ALL SCI. & ENGR.
PHYSICAL SCIENCES	ASTRONOMY	$223,794,649	65.7%	
	CHEMISTRY	$7,606,967	2.2%	
	PHYSICS	$84,987,856	24.9%	
	PHYSICAL SCIENCE, NEC*	$24,266,080	7.1%	
	Total	**$340,655,552**		**34.0%**
PSYCHOLOGY	BIOLOGICAL	$976,636	22.1%	
	PSYCHOLOGY SOCIAL ASPECTS	$1,286,482	29.1%	
	PSYCHOLOGY, NEC*	$2,159,875	48.8%	
	Total	**$4,422,993**		**0.4%**
SOCIAL SCIENCES	SOCIAL SCIENCE, NEC*	$1,600,566	100.0%	
	Total	**$1,600,566**		**0.2%**
	ALL DISCIPLINE(S)	$152,989,707	100.0%	
	OTHER SCIENCES Total	**$152,989,707**		**15.3%**
	Grand Total All of Science & Engineering	**$1,001,322,453**		**100.0%**

*NEC: Not elsewhere classified.